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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Steven Taylor Morris

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QUARLES & BRADY LLP  
411 E. WISCONSIN AVENUE  
SUITE 2040  
MILWAUKEE, WI 53202-4497

EXAMINER

ROY, BAISAKHI

ART UNIT

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3737

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DELIVERY MODE

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/713,417	<b>Applicant(s)</b> MORRIS ET AL.	
	<b>Examiner</b> BAISAKHI ROY	<b>Art Unit</b> 3737	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 17 November 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments, with respect to the rejection(s) of claim(s) 1-22 under Lockwood have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of newly found prior art.

### ***Double Patenting***

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claims 1-22 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-18 of U.S. Patent No. 7223243.

Although the conflicting claims are not identical, they are not patentably distinct from each other because the patented claims directed to a thin film piezoelectric material

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using an array of metallic backer plates for ultrasonic measurement and/or imaging anticipates the claims of current application.

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-3 and 8-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Ohigashi et al. (4383194). Ohigashi et al. disclose a transducer element that includes a polymeric piezoelectric film of a reduced thickness to enable transmission of ultrasonic waves. The transmitter includes a polymeric piezoelectric film 11 made of material such as PVDF, an additional metallic layer or backer plate adhered to a rear face of the piezoelectric polymer film 14b, (fig. 1, 2), the additional layer having a thickness of 0.5  $\mu\text{m}$  up to  $1\lambda/16$ , when said additional layer is located on the side opposite to the acoustic emanation side and said additional layer has a thickness of 0.5  $\mu\text{m}$  up to  $3\lambda/8$  when located on the acoustic emanation side. (col. 2 lines 31-44) The additional layer thus have a thickness specified in relation the wavelength of sound waves within the additional layer at the free resonant frequency of the polymeric piezoelectric film. Therefore the metallic backer plate adhered to the rear face of the piezoelectric polymer film has a thickness along the signal path substantially thinner than one wavelength or  $\frac{1}{2}$  wavelength of the frequency of the acoustic signal. The backer plate or additional

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layer is composed of a plurality of independent electrodes (13a, 13b). The ultrasonic transmitter further includes a support structure or holder 16, coupled to the rear side surface of the transducer element (fig. 1G), supporting the metallic backer plate, where the holder is made up of any kind of material, including a thermoplastic material, having a small acoustic impedance (col. 6 lines 49-57). The additional layer or metallic backer plate is formed with metal such as Al, Cu, Ag, Sn, etc. (col. 3 lines 31-33) and the holder is made up different materials such as PMNA, polystyrene, ABS, bakelite and epoxy resin. Therefore, with the use of different materials for the support and the plate, it is clear and well known in the art that the acoustic impedance of each structure would be different from each other.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claim 15 is rejected under 35 U.S.C. 102(b) as being anticipated by Ueno et al. (5377682). Ueno et al. disclose an ultrasound imaging device comprising an ultrasound transducer having a piezoelectric film 321 adapted to transmit an ultrasonic acoustic signal, a backing member 322 and an acoustic matching layer 323 adhered to the rear face of the piezoelectric polymer film (col. 18 lines 52-col. 19 line 4). The system also includes an ultrasound receiver for receiving the ultrasonic acoustic signal along a

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signal path through a portion of the human body, and an output device providing an image formed from the received ultrasonic acoustic signal (col. 19 lines 10-20).

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 4-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohigashi et al. in view of Hamada et al. (4628573). Ohigashi et al. do not explicitly teach an annular setup of the transducer element. In the same field of endeavor Hamada et al. disclose an array type ultrasonic probes include an annular array type comprising a substrate, a plurality of transducer elements disposed on the substrate, a plurality of electrodes, a piezoelectric polymer film, and providing an integral plate of a structure comprising the electrodes and the connections (col. 3 lines 18-38). Hamada et al. also teach an annular setup for producing an annular array-type probe with an outer annular portion surrounding an inner center portion (see fig. 3-6, col. 4 lines 33-39). The arrangement further includes electrode arrangement and connecting lead wires to the individual back electrodes making up the plate (fig. 4, col. 4 lines 40-68). A polymeric piezoelectric film of 0.05 micron in thickness is applied and thus forming the disk-shaped annular array-type structure (col. 5 lines 1-11, fig. 5). It would have therefore been obvious to one of ordinary skill in the art to use an annular array-type arrangement found in Hamada et al. in place to the transducer structure as disclosed in

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Ohigashi et al. to ensure a better and more integrated arrangement for handling and to enhance ultrasonic transmission and performance.

7. Claims 16-17, and 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ueno et al. in view of Ohigashi et al. Ueno et al. teach of differences in acoustic impedance between the piezoelectric film, the acoustic matching layer, and the propagation medium but do not explicitly teach of a difference in acoustic impedance between the support structure and the metallic backer plate and the specifics of the backer plate. In the same field of endeavor Ohigashi et al. disclose a transducer element that includes a polymeric piezoelectric film of a reduced thickness to enable transmission of ultrasonic waves. The transmitter includes a polymeric piezoelectric film 11 made of material such as PVDF, an additional metallic layer or backer plate adhered to a rear face of the piezoelectric polymer film 14b, (fig. 1, 2), the additional layer having a thickness of  $0.5\ \mu\text{m}$  up to  $1\lambda/16$ , when said additional layer is located on the side opposite to the acoustic emanation side and said additional layer has a thickness of  $0.5\ \mu\text{m}$  up to  $3\lambda/8$  when located on the acoustic emanation side. (col. 2 lines 31-44) The additional layer thus have a thickness specified in relation the wavelength of sound waves within the additional layer at the free resonant frequency of the polymeric piezoelectric film. Therefore the metallic backer plate adhered to the rear face of the piezoelectric polymer film has a thickness along the signal path substantially thinner than one wavelength or  $\frac{1}{2}$  wavelength of the frequency of the acoustic signal. The backer plate or additional layer is composed of a plurality of independent electrodes (13a, 13b). The ultrasonic transmitter further includes a support structure or holder 16,

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coupled to the rear side surface of the transducer element (fig. 1G), supporting the metallic backer plate, where the holder is made up of any kind of material, including a thermoplastic material, having a small acoustic impedance (col. 6 lines 49-57). The additional layer or metallic backer plate is formed with metal such as Al, Cu, Ag, Sn, etc. (col. 3 lines 31-33) and the holder is made up different materials such as PMNA, polystyrene, ABS, bakelite and epoxy resin. Therefore, with the use of different materials for the support and the plate, it is clear and well known in the art that the acoustic impedance of each structure would be different from each other. It would have therefore been obvious to one of ordinary skill in the art to use the material for the backer plate and support structure as taught by Ohigashi et al. in place of the materials used by Ueno et al. to ensure transmission of ultrasonic waves having frequencies lower than its inherent resonant frequency with reduced transmission loss.

8. Claims 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ueno et al. in view of Hamada et al. Ueno et al. do not explicitly teach an annular setup of the transducer element. In the same field of endeavor Hamada et al. disclose an array type ultrasonic probes include an annular array type comprising a substrate, a plurality of transducer elements disposed on the substrate, a plurality of electrodes, a piezoelectric polymer film, and providing an integral plate of a structure comprising the electrodes and the connections (col. 3 lines 18-38). Hamada et al. also teach an annular setup for producing an annular array-type probe with an outer annular portion surrounding an inner center portion (see fig. 3-6, col. 4 lines 33-39). The arrangement further includes electrode arrangement and connecting lead wires to the individual back



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electrodes making up the plate (fig. 4, col. 4 lines 40-68). A polymeric piezoelectric film of 0.05 micron in thickness is applied and thus forming the disk-shaped annular array-type structure (col. 5 lines 1-11, fig. 5). It would have therefore been obvious to one of ordinary skill in the art to use an annular array-type arrangement found in Hamada et al. in place to the transducer structure as disclosed in Ueno et al. to ensure a better and more integrated arrangement for handling and to enhance ultrasonic transmission and performance.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to BAISAKHI ROY whose telephone number is (571)272-7139. The examiner can normally be reached on M-F (7:30 a.m. - 4p.m.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian L. Casler can be reached on 571-272-4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/BRIAN CASLER/  
Supervisory Patent Examiner, Art  
Unit 3737

BR  
/B. R./  
Examiner, Art Unit 3737